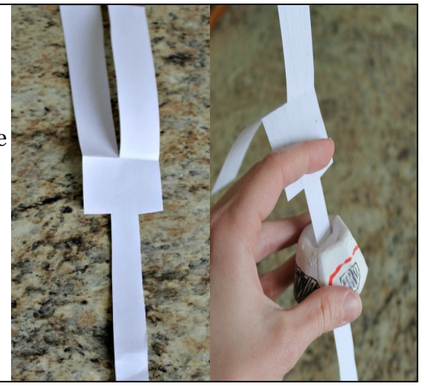
What keeps helicopters in the air?

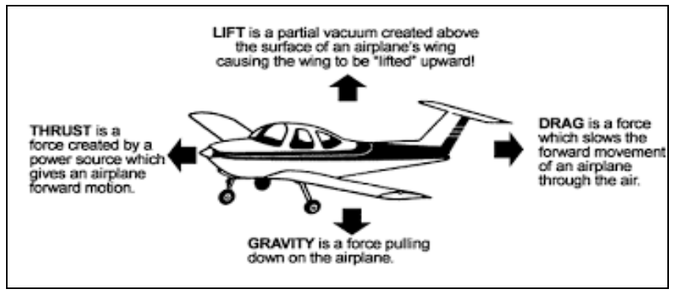
Materials: 8.5 x 11 sheet of paper, 2 sections from an egg carton, scissors, tape.

Cut a 1 inch strip from the long side of the paper. Fold that strip in half. Cut the top portion in half lengthwise. Trim the bottom portion to make the final shape into a Y.

Cut a small slit in the top edges of both egg carton sections. Slide the tail of the paper strip through the bottom of one carton section and the top of the other making a sphere shape. Fasten the paper to the bottom of the carton section.

Drop the helicopters from different heights to test. Experiment with different weights of paper, helicopter blade lengths and egg carton materials to see which works best.





Innovative women in aviation: Suzanne Asbury-Oliver began flying gliders at 14, and first soloed when she was just 15 years old. By the time she was 18, Oliver had her powered-aircraft instrument rating, commercial certificate, flight instructor and instrument-flight instructor certificates, as well as a multiengine rating. She had become an aviation professional. When she saw an advertisement put out by Pepsi-Cola for a skywriter, Oliver first thought it would be impossible to get the job. But she realized there probably wasn't anyone more qualified, inquired about the position and was promptly put in a plane with the current Pepsi skywriter. Skywriting is not only a time-honored advertising tradition, but one of the most exciting and influential forms of advertisement. The Pepsi-Cola company has used the skywriting advertising technique since 1932, and it is perhaps the only company that still employs skywriting today. Asbury-Oliver has been skywriting messages across the skies above the United States and Canada for Pepsi since 1980. From the open cockpit of the famous 1929 Travel Air biplane, the Pepsi SkyWriter, Oliver created thousands of letters 3,048 meters (10,000 feet) above the earth for Pepsi Cola and she remains the only professional female skywriter in the world. *Smithsonian National Air & Space Museum

Now that I've earned this badge, I can give service by:

- Exploring a silver award project about aviation.
- Organizing an aviation exploration event for younger scouts.
- Joining Civil Air Patrol to serve my community though aviation.

Written by Kentucky Bluegrass Ninety-Nines 2017

The Ninety-Nines are an international organization of women pilots that promotes advancement of aviation through education, scholarships and mutual support while honoring our unique history and sharing our passion for flight.

To order this badge contact: tgsanders@att.net

Cadette Aviation Badge

"It changes you, flying. The first time I felt the basket lurch aloft and watched the ground recede, something swelled inside me like the linseed-oiled cotton canopy overhead." *

Mary Hawley Myers was the first woman to pilot her own aircraft in 1880 and her story still resonates today. Are you ready to see how aviation can change you? *From "Where No Man Can Touch" by Pat Valdata

Steps: Preflight
Taxi
Takeoff
Flight
Landing

Purpose: When I've earned this badge, I'll better understand the diverse world of aviation.

Preflight: Choices—Do one

- Learn what it takes to make aircraft fly. What are the forces that act on the aircraft? OR
  How do hot air balloons fly? What does it take to become a balloon pilot? Learn more about this sport. OR
  Helicopters are very useful for many tasks. What makes a helicopter fly? Name 5 uses for helicopters.
- Read 2 novels or stories about air travel. They can be real or imaginary. They could be historical or 100 years into the future. How do they portray air travel? Is the imaginary possible?
- Learn about weather and how it affects a flight. List 5 weather conditions that can challenge or stop air travel. Learn how to read an aviation weather report and forecast.

Taxi: Choices—Do one

- Make a list of at least 15 different roles that are involved in air transportation. Pick your 3 favorite and find out details about each including education, age, experience, etc. Do research or interview people in those roles.
- Aircraft are important to the military. How are women involved in aviation in the military? What kind of commitment is required. Research or interview a female veteran.
- Learn about Civil Air Patrol and its goals. How do you join? Is there a patrol in your area? Find out about age requirements, uniform, and missions. Invite a cadet to your meeting.

How to find center of gravity

Center of gravity is important in aviation and refers to the central location that gravity acts on the object. In this activity, this is straight down from the spot where the toothpick sits on the rim of the glass (pivot point).

Materials needed: 2 forks, rounded toothpick, heavy drinking glass (half-full with water).

Push the forks together so that the tines are interlocked tightly.

Balance the utensils on a fingertip to find the middle point. This is where the toothpick should be inserted between the utensils. Work the toothpick into the tines of the fork.

Carefully set the toothpick on the rim of the glass. Slowly slide it in and out across the rim until you've found the best balance point. Both handles will be curving downward below the rim of the glass and the toothpick will be almost horizontal.

Takeoff: Choices—Do one

- What are the types of aeronautical charts that pilots use to navigate? Obtain some from different cities and compare the similarities and differences. Learn symbols from the legend and their significance. (available through general aviation airport or online through FAA.gov)
- How does weight and balance affect aircraft? Learn how pilots measure aircraft capacity and how many passengers and baggage their plane can carry. What can they do to compensate for weight? How do cargo planes distribute their weight?
- Learn about important women in aviation history. Investigate their life and their accomplishments. Do a brief biography on one to share with others.

Innovative women in aviation: Willa Brown was the first African American woman to earn a US pilot license (1938) and a commercial license (1939). She was also the first African American woman to become an officer in the Illinois Civil Air Patrol (CAP). Willa joined the Challenger Air Pilots Association and learned to fly at Harlem Field, on the southwest side of Chicago. In 1935 she earned her Master Mechanic Certificate and began giving flight and ground school instruction at the field. She and her husband Cornelius Coffey organized CAP Squadron 613 in conjunction with his school, the Coffey School of Aeronautics, and she held the ranks of lieutenant and adjutant in the organization. She was the director of the Coffey School when it was selected by the Civil Aeronautics Administration as one of several black schools and colleges to offer the Civilian Pilot Training Program (CPTP — a program that trained thousands of pilots throughout the US). The success of the Coffeys and other black aviation students led to the eventual admission of blacks into the Army Air Forces through the War Training Service Program (WTS) at these schools and provided a pool of instructors and trainees at Tuskegee Army Air Field. ***Smithsonian National Air & Space Museum**

Flying in small private planes, helicopters, blimps or hot air balloons are not approved as Girl Scout Program activities.

Flight: Choices—Do one

- Use a flight simulator to experience what flying is like. Become familiar with the skills needed to take off, land and navigate.
- Take a tour of a general aviation airport. What characteristics does a general aviation airport have? Interview the airport manager and find out about the services offered. Visit several local airports and note their differences and similarities.
- Maintenance and repairs are important to keep planes in top condition. Visit a maintenance facility and find out what do mechanics do to keep planes safe and flying? Where do they learn those skills?

The original "Fly Girls". Between 1942 and 1944 over 1,000 women were trained to fly for the US military as WASP.

Landing: Choices—Do one

- Air traffic controllers coordinate the flow of traffic around the world. Learn about the tools they use and the information that they provide to pilots. Tour a control tower to see the equipment.
- What does it take to become an airline pilot? Research or interview someone from that profession. What education classes are needed to prepare someone for that career? What jobs are available in your community?
- Explore alternative energy sources that aircraft use such as—electric power, bio fuel, solar powered batteries and non powered flight (soaring on natural currents of air).

Animals flew in balloons before people. What animals flew in those first flights?